PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
IN/PA-62		
International application No.	International filing date (*day/month/year*)	Priority Date (*day/month/year*)
PCT/IN 2003/000374	1 December 2003 (01.12.2003)	20 December 2002 (20.12.2002)

International Patent Classification (IPC) or national classification and IPC

IPC[7]: G01N 31/00, G01N 33/00 // C07K 14/445

Applicant

THE REGISTRAR, INDIAN INSTITUTE OF SCIENCE

1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I. ☒ Basis of the opinion
- II. ☐ Priority
- III. ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV. ☐ Lack of unity of invention
- V. ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI. ☐ Certain documents cited
- VII. ☐ Certain defects in the international application
- VIII. ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24.06.2004	28 February 2005 (28.02.2005)
Name and mailing address of the IPEA/AT Austrian Patent Office Dresdner Straße 87 A-1200 Vienna Facsimile No. 1/53424/200	Authorized officer GÖRNER W. Telephone No. 1/53424/558

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/IN 2003/000374

I. Basis of the report

1. With regard to the **elements** of the international application:*

☒ the international application as originally filed

☐ the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the claims:
pages _____, as originally filed
pages _____, as amended (together with any statement) under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the drawings:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____.

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____.

☐ the claims, Nos. _____.

☐ the drawings, sheets/fig _____.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

** Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

*** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/IN 2003/000374

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-6	YES
	Claims	----	NO
Inventive step (IS)	Claims	1-6	YES
	Claims	----	NO
Industrial applicability (IA)	Claims	1-6	YES
	Claims	----	NO

Citations and explanations (Rule 70.7)

The following documents have been cited in the Search Report:

D1: Grenert J.P., et al. "The Amino-terminal Domain of Heat Shock Protein 90 (hsp90) That Binds Geldanamycin Is an ATP/ADP Switch Domain That Regulates hsp90 Conformation". The Journal of Biological Chemistry, 1997, Vol. 272, No. 38, pp. 23843-23850

D2: Gowrishankar Banumathy, et al. "Heat Shock Protein 90 Function Is Essential for Plasmodium falciparum Growth in Human Erythrocytes". The Journal of Biological Chemistry, 2003, Vol. 278, No. 20, pp. 18336-18345

D3: Rajinder Kumar, et al. "The heat shock protein 90 of Plasmodium falciparum and antimalarial activity of its inhibitor, geldanamycin". Malaria Journal, 15. 09. 2003, 2:30, pp. 1-11

D4: WO 2003/0050295A2 (Conforma Therapeutics Corporation) 19.06.2003

Document D1 describes that geldanamycin binds to hsp90 and demonstrates the hsp90 domain acting as geldanamycin-binding site defined by mutation-analysis.
Document D2 describes the inhibitory mechanism of geldanamycin-binding to the hsp90 domain acting as geldanamycin-binding site by selective inhibition of hsp90 phosphorylation causing growth inhibition.
Document D3 mentions that hsp90 has been used as a drug target for geldanamycin and the antigenic role of hsp90 in malaria. Geldanamycin binding of hsp90 is tested by competition assays using ATP-sepharose bound hsp90 incubated with geldanamycin.
Document D4 describes a competitive binding assay between immobilised labelled hsp90 and a differently labelled or unlabeled ligand.

Novelty and Inventive step

In the light of the cited documents, especially document D1, Plasmodium falciparum hsp90 is known as a drug target for the plasmodium falciparum growth inhibitor geldanamycin and can be used to screen for further antimalarial drugs. However, none of the cited documents mentions a method according to the subject matter of claims 1-6, i.e.

Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: Box V (page 1)

contacting ligand molecules that are immobilized on solid phase matrices with Plasmodium falciparum lysates and subsequent detection of bound Pfhsp90, the invention is novel.

None of the cited documents suggests a method wherein the test compounds are covalently linked on suitable matrices and incubated with Plasmodium falciparum lysates before detection of hsp90. Documents D1 describes ATP/Geldanamycin- and Geldanamycin-derivative-Sepharose binding assay using in vitro translated chicken hsp90, document D3 describes an binding assay to show that hsp90 binds to ATP-sepharose except when pre-treated with geldanamycin and document D4 uses cancer- and normal cell-derived hsp90 coated 96-well plates for ELISA assays. The subject matters of claims 1-6 are therefore inventive.

Industrial applicability
Industrial applicability is given.

Remark:
The applicant should be aware that, in addition to document D4, the category of documents D2 and D3 is also P,A.